REMARKS

1. Rejection under 35 U.S.C. §112.

Claims 18 stands rejected under 35 U.S.C. §112 as being indefinite.

Claim 18 has been amended to remove the offending term "ALCALASE". Thus, it is respectfully requested that this rejection be reconsidered and withdrawn.

2. Rejection under 35 U.S.C. 102

Riehle et al. US 6,554,961 or US 2003/0205345

The office action asserts that Reihle (US 6554961) discloses a process for rendering a polyamine-epihalohydrin resin storage stable, that includes treating a composition containing a polyamine-epihalohydrin resin, the composition comprising a solids content of at least 15<% (21%, see example 75) and including CPD-forming species, with at least one enzymatic agent under conditions to at least one of inhibit, reduce and remove the CPD-forming species to obtain a gelation storage stable reduced CPD-forming resin so that the composition containing the reduced CPD-forming polyamine–epihalohydrin resin when stored for 24 hours at 50 deg C, and a pH of about 1.0 release less than about 250 ppm dry basis of CPD (See Example 75 and Table 31). The Applicants respectfully disagree.

In Example 75 of US 6554961, the UNTREATED resin has a solids content of 21% however BEFORE treatment the resin is diluted (see col. 89, lines 51-55) In Table 31, the first col.1- first row shows an UNTREATED resin all enzyme treated resins were at a 13.5% solids content. Applicants therefore submit that to treat a resin with a solids content of above 15 %, which is claimed in the present invention, is not taught in Riehle US 6554961.

All dependent claims, claims 2-13, 14-16 and 18-25, 34-36 are dependant directly or indirectly on claim 1 or 36 which require that the solids content be a least 15% or greater. Riehle US 6554961 does not teach the high solids content. Therefore any claims that include the limitation of the high solids content are not anticipated by the reference of Riehle US 6554961.

Thus, it is respectfully requested that this rejection be reconsidered and withdrawn.

3. **Rejection: Double patenting**

a) Claims 2-37 stand rejected under 35 U.S.C. §101 as claiming the same invention as co pending Application 10/006,027.

For a same invention double patenting rejection the Office Action must show that the claims in the issued patent, in this case co-pending application, and the pending patent can not be literally infringed without literally infringing one another.

Claim 1 of co-pending application is being amended to include an additional limitation not found in the claims of the present application. It is believed that this additional limitation, which becomes part of all of the dependant claims, overcomes the rejection based on 25 U.S.C. §101. The claims of the present application can be practiced without necessarily literally infringing the claims of the co-pending application. Thus, it is respectfully requested that this rejection be reconsidered and withdrawn.

b) Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claim 1 of co-pending Appl. No. 10/006,027. The focus of a double patenting analysis is on the claims (MPEP 804). Claim 1 of the present application as amended includes a limitation that is not taught in the claims of co pending Appl. No. 10/006,027. Therefore the claims of the present application as

amended are not obvious in light of the co pending Appl. No. 10/006,027 claims. Thus, it is respectfully requested that this rejection be reconsidered and withdrawn.

c) Claim 1-25 and 34-36 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claim 1 of co-pending Appl. No. 10/396,155. Applicants content that the present invention is patentable over the cited art as being unexpected. It is Applicants' contention that a person skilled in the art would not have expected that the process of the present invention could be accomplished at higher solids contents, see page 40, line 27 to page 41, line 41 of the present application.

> "It was NOT (emphasis added) expected that biodehalogenation could be accomplished at high solids concentration due to lack of water for the microorganisms, higher osmotic pressure for higher solids content, and undefined problems, such as concentration of low molecular weight species. Moreover, it would be expected that pretreatment to remove higher residuals may be needed, such as by dilution or filtration. Moreover, it would NOT (emphasis added) be expected that biodehalogenation could be achieved in a reasonable period of time, such as within 48 hours. Still further, there would be an EXPECTATION OF STORAGE INSTABILITY AT HIGH SOLIDS concentrations (emphasis added); however, the resin compositions according to the present invention are storage stable, and are not susceptible to gelling. The advantages of the present invention are obtained for high solids whether

or not the resin composition is treated to remove or reduce CPD-forming species."

The focus of a double patenting analysis is on the claims (MPEP 804). The claims of co-pending Appl. No. 10/396,155 do not teach or suggest treating a resin with a solids content of greater than 15% with an enzymatic agent. Therefore the present application is not an obvious variation of the co-pending appl. 10/396,155.

For these reasons, it is respectfully requested that this rejection be reconsidered and withdrawn.

It is submitted that the foregoing reply is completely responsive under 37 CFR 1.111 and that all grounds of rejection and objection have been completely overcome or obviated. It is submitted that all claims are now in condition for allowance and a notice of allowance for all pending claims is respectfully requested.

An extension of time has been filed with this amendment.

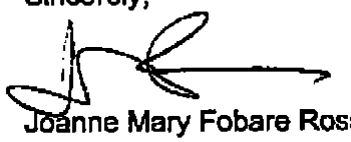
An additional dependant claim has been added. The commissioner is hereby authorized to charge the claim fee of 18 dollars to deposit account 08-1800.

Beyond the extension of time and the additional dependant claim fee it is believed that there are no additional fees required for entry of this amendment or for maintaining the pendency of this application. If there are any additional fees required to have this amendment entered or to keep the application pending the commissioner is hereby authorized to change the fee to deposit account number 08-1800.

Serial Number: 10/013,049
Art Unit: 1744

Should there be any questions or comments regarding this paper or the present application, Examiner is invited to contact the undersigned at the below listed telephone number.

Sincerely,



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Serial Number: 10/013,049
Art Unit: 1744

LISTING OF PENDING CLAIMS

We claim:

1. (original) A process for rendering a polyamine-epihalohydrin resin storage stable, comprising:

treating a composition containing a polyamine-epihalohydrin ~~creping~~ resin, the composition comprising a solids content of at least 15 wt% and including CPD-forming species, and wherein the resin is formed in a reaction having a molar ratio of epihalohydrin to secondary amine group of less that about 0.50, with at least one enzymatic agent under conditions to at least one of inhibit, reduce and remove the CPD-forming species to obtain a gelation storage stable reduced CPD-forming resin so that the composition containing the reduced CPD-forming polyamine-epihalohydrin resin when stored for 24 hours at 50°C, and a pH of about 1.0 releases less than about 100 ppm dry basis of CPD.

2. (original) The process according to claim 1, wherein the composition containing the reduced CPD-forming polyamine-epihalohydrin resin when stored for 24 hours at 50°C, and a pH of about 1.0 releases less than about 50 ppm dry basis of CPD.

3. (original) The process according to claim 1, wherein the treatment conditions comprise a temperature of from about 20°C to 60°C.

4. (original) The process according to claim 3, wherein the treatment conditions comprise a temperature of from about 20°C to 40°C.

5. (original) The process according to claim 1, wherein the treatment conditions comprise a reaction time of from about 30 minutes to about 96 hours.

6. (original) The process according to claim 5, wherein the treatment conditions comprise a reaction time of from about 2 hours to about 12 hours.

7. (original) The process according to claim 1, wherein the treatment conditions comprise a pH of from about 2.5 to about 9.

8. (original) The process according to claim 7, wherein the treatment conditions comprise a pH of from about 7 to about 9.

9. (original) The process according to claim 8, wherein the treatment conditions comprise a pH of from about 6 to about 8.5.

10. (original) The process according to claim 1, wherein the ratio of at least one enzymatic agent to polyamine-epihalohydrin resin (dry basis) is from about 1:1600 to about 1:1.5.

11. (original) The process according to claim 10, wherein the ratio of at least one enzymatic agent to polyamine-epihalohydrin resin (dry basis) is from about 1:160 to about 1:4.

12. (original) The process according to claim 1, wherein the ratio of at least one enzymatic agent (active enzyme, dry basis) to polyamine-epihalohydrin resin (dry basis) is from about 0.04:1600 to about 0.04:1.5.

13. (original) The process according to claim 1, wherein the solids content is 15 to 50 wt% active solids, the treatment conditions comprise a temperature of from about 0°C to about 35°C, a reaction time of from about 4 to about 24 hours, a pH of from about 6.9 to about 7.9, the ratio of at least one enzymatic agent to polyamine-epihalohydrin resin (dry basis) is from about 1:20 to about 1:8.

14. (original) The process according to claim 1, wherein the at least one enzymatic agent is selected from the group consisting of an esterase, a lipase, a protease or a combination thereof.

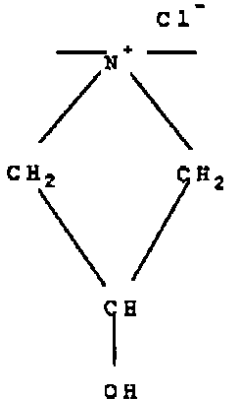
15. (original) The process according to claim 1, wherein the at least one enzymatic agent is a protease in the subtilisin group.

16. (original) The process according to claim 1, wherein the at least one enzymatic agent has esterase activity.

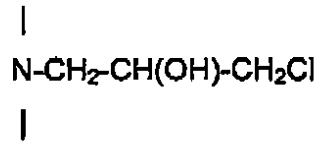
17. (original) The process according to claim 1, wherein the at least one enzymatic agent is produced from a microorganism selected from the group consisting of *Bacillus licheniformis* (Swiss-Prot Accession Number: P00780), or *Bacillus amyloliquifaciens* (P00782), and *Bacillus lentus* (P29600).

18. (currently amended) The process according to claim 1, wherein the at least one enzymatic agent is ~~ALCALASE~~ in the subtilisin group.

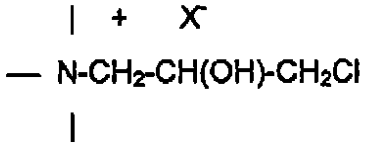
19. (original) The process according to claim 1, wherein the resin is characterized by the presence of the functionality represented by the formula:



20. (original) The process according to claim 1, wherein the resin is characterized by the presence of the functionality represented by the formula:



21. (original) The process according to claim 1, wherein the resin is characterized by the presence of the functionality represented by the formula:



wherein X^- is an anion.

22. (original) The process according to claim 1, wherein, at least one of simultaneously with, prior to or subsequent to the treating a composition containing polyamine-epihalohydrin resin to obtain a reduced CPD-forming resin,

the resin is contacted with at least one microorganism, or at least one enzyme isolated from the at least one microorganism, in an amount, and at a pH and temperature effective to dehalogenate residual quantities of organically bound halogen.

23. (original) The process according to claim 22 wherein the at least one microorganism, or at least one enzyme isolated from the at least one microorganism is a hydrogen halide lysase type dehalogenase.

24. (original) The process according to claim 22 wherein the at least one microorganism, or at least one enzyme isolated from the at least one microorganism comprises at least one of *Arthrobacter histidinolovorans* (HK1), and *Agrobacterium radiobacter* (HK7).

25. (original) The process according to claim 22, wherein the at least one microorganism comprises a mixture comprising at least one of *Agrobacterium radiobacter* (HK7) and, *Arthrobacter histidinolovorans* (HK1).

26. (original) The process according to claim 1, wherein, simultaneously with the treating a composition containing polyamine-epihalohydrin resin to obtain a reduced CPD-forming resin, the CPD-forming resin is contacted with at least one microorganism, or at least one enzyme isolated from the at least one microorganism, in an amount, and at a pH and temperature effective to dehalogenate residual quantities of organically bound halogen.

27. (original) The process according to claim 26, wherein the treatment conditions comprise a reaction time of 48 hours or less.

28. (original) The process according to claim 26, wherein the temperature of from about 20°C to 35°C.

29. (original) The process according to claim 26, wherein the treatment conditions comprise a pH of from about 6.5 to 8.0.

32. (deleted) The process according to claim 26 wherein the ratio of at least one enzymatic agent to polyamine-epihalohydrin resin (dry basis) is from about 1:1600 to about 1:1.5.

30. (original) The process according to claim 26 wherein the at least one microorganism, or at least one enzyme isolated from the at least one microorganism is a hydrogen halide lysase type dehalogenase.

31. (original) The process according to claim 26 wherein the at least one microorganism, or at least one enzyme isolated from the at least one microorganism comprises at least one *of Arthrobacter histidinolovorans* (HK1), and *Agrobacterium radiobacter* (HK7).

32. (original) The process according to claim 26, wherein the at least one microorganism comprises a mixture comprising at least one of *Agrobacterium radiobacter* (HK7) and, *Arthrobacter histidinolovorans* (HK1).

33. (original) The process according to claim 26 wherein the treatment conditions comprise a reaction time of 48 hours or less, a temperature of from about 20°C to 35°C, a pH of from about 6.5 to about 8.0 and the ratio of at least one enzymatic agent to polyamine-epihalohydrin resin (dry basis) is from about 1:1600 to about 1:1.5 and the at least one microorganism comprises a mixture comprising at least one of *Agrobacterium radiobacter* (HK7) and, *Arthrobacter histidinolovorans* (HK1).

34. (original) The process according to claim 1, wherein, simultaneously, prior to or subsequent to the treating a composition containing polyamine-epihalohydrin resin to obtain a reduced CPD-forming resin, the resin is treated to reduce at least one of epihalohydrins, epihalohydrin hydrolysis by-products and organic halogen bound to the polymer backbone.

35. (original) A process for preparing a paper product, comprising:

treating a composition containing polyamine-epihalohydrin ~~creping~~ resin, the composition comprising a solids content of at least 15 wt% and including CPD-forming species, and wherein the resin is formed in a reaction having a molar ratio of epihalohydrin to secondary amine group of less that about 0.50, with at least one enzymatic agent under conditions to at least one of inhibit, reduce and remove the CPD-forming species to obtain a gelation storage stable reduced CPD-forming resin, and forming a paper product with the reduced CPD-forming polyamine-epihalohydrin resin, so that a paper product, when corrected

for adding at about a 1 wt% addition level of the reduced CPD-forming resin, contains less than about 250 ppb of CPD.

36. (original) The process according to claim 35, wherein the paper product, when corrected for adding at about a 1 wt% addition level of the reduced CPD-forming resin, contains less than about 50 ppb of CPD.

37. (original) The process according to claim 35, wherein the solids content is 15 to 50 wt% active solids, the temperature of the reaction is from about 0°C to about 35°C, the reaction time is from about 4 to about 24 hours and the pH of the reaction is from about 6.9 to about 7.9, the ratio of at least one enzymatic agent to polyamine-epihalohydrin resin (dry basis) is from about 1:20 to about 1:8.

38. (new) The process according to claim 26 wherein the ratio of at least one enzymatic agent to polyamine-epihalohydrin resin (dry basis) is from about 1:1600 to about 1:1.5.